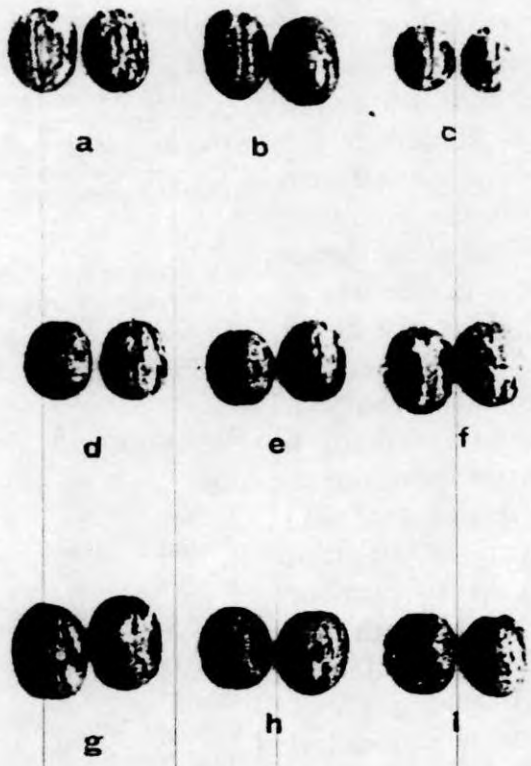
SEED CERTIFICATION

Joseph G. Marattukalam and C.K. Sarawathy Amma

Rubber Reserch Institue of India

Production of improved varieties of seeds and other propagation materials and their marketing have now become a major commercial venture. A large number of producers are involved in the production of these materials and thousands of farmers are using them for cultivation. Because of the great demand for the new cultivars and the attractive price commanded by these materials, on many occasions some producers had resorted to the sale of poor quality or even wrong materials to the farmers. This has resulted in great loss to those who undertook commercial cultivation of these materials. The system of seed certification was introduced to avoid the recurrence of such incidents. This system is designed to control and maintain the purity and quality of the propagating materials supplied by the producers. Under this system, agencies are identified by the government of each country to operate the system. Minimum seed certification standards are also prescribed. These include specifications regarding the land requirements, design of planting, isolation belt, characters of parents, method of seed collection, quality of seeds, raising of seedlings in nursery, characters of seedlings etc. Wherever required laboratory test of sample seeds are also carried out to ascertain their quality. In addition, procedures are laid out for the inspection of the fields, where the seeds are produced as well as the seeds marketed. Experts are trained and entrusted with the inspection work. In India, the system of seed certification came to force in 1969 by the adoption of the Seeds Act. Under this



act an apex body titled 'The Central Seed Committee' is established to supervise all activities in this regard.

Certification standards for rubber propagation materials

Rubber is propagated primarily through budded plants. Seeds are used mainly to raise stock plants for budding. One particular type of hybrid seeds namely polyclonal (Polycross) seeds alone are used for field planting. Specific standards are prescribed by the Rubber Board for the production of these seeds.

1. Polyclonal seeds

Polyclonal seeds are produced in certain specially established rubber plantations called polyclonal seed gardens. In these gardens improved clones are planted as per specific designs so that each tree of a clone is surrounded by trees of the other clones and more than one tree of the same clone are never planted adjacently. Number of clones that can be accommodated in a garden varies from four to nine. Different suitable designs can be adopted depending on the number of clones planted in the garden. Clones planted in polyclonal seed gardens should possess 5 essential promising characteristics. These are high yield, good secondary characters, profuse production of seeds, synchronised flowering and ability to produce good seedling families. Density of planting is 358 trees/ha later reduced to 247 by the 6th year. To prevent contamination by unwanted pollen, an isolation belt of 100 m width is provided around the polyclonal garden. This area should be preferably planted with any crop other than rubber or by one of the clones included in the garden. Experts of the Rubber Board visit the garden and ascertain whether the garden confirm to the prescribed specifications, before approving them. Seeds are collected when they fall down by the dehiscence of fruits. When left in the field the seeds lose their viability very fast. Hence they are collected every day. After collection, poor quality seeds such as those infected by diseases, deformed, very light, without good kernel etc. are discarded. Healthy ones are either immediately used for germination or mixed with wet charcoal powder and packed in containers for storing/transporting.

2. Assorted seeds

Assorted seeds collected from different plantations indiscriminately are generally used for raising stock plants for budding. In the case of these materials, the source is not given any importance. All healthy

Selection standards for budding materials

Budding material	Green budding	Brown budding
Stock Plant		
Age	2 to 8 monts	10 to 24 months
Girth above collar region	2.5 cm	7.5 cm
Colour of bark upto 15 cm from collar	brown	brown
Peeling of bark	easy	easy
Growth	vigorous	vigorous
Bud wood		
Age	1.5 to 2 months	12 to 18 months
Colour	green	brown
Peeling of bark	easy	easy
Growth	vigorous	vigorous
Bud patch		
Length	5 cm	5 cm
Width	1 cm	1.5 cm
Colour	green	brown
Type of bud	scale bud	leaf bud

seeds irrespective of the source clone or size are used. Method of packing is same as that adopted for polyclonal seeds. Minimum germination percentage for rubber seeds is 75%. To make up for the 25% non-viable seeds usually 25% extra seeds are put into the containers (free of charge) at the time of packing.

3. Stock plants

Selection is done among the stock at the time of budding. Criteria adopted for this purpose are age and girth above the collar region (place of budding). The minimum age of seedling for green budding (budding with green buds) is 2 months and the maximum age is 8 months. Minimum girth prescribed is 2.5 cm for brown budding (budding with brown buds) the age prescribed for stock plants is minimum 10 months and maximum 24 months and minimum girth 7.5 cm. Both types of stocks should be vigorously growing and the bark should peel off very easily.

4. Buds

Buds used for green budding should be green in colour. They are collected from young branches (green shoots) 6-8 weeks old and with one whorl of leaves. Buds found in the axils of scale leaves alone are used for budding. Buds are taken out along with a patch of bark having a length of 5 cm and width of 1 cm.

For brown budding, brown coloured buds alone are used. They are collected after the subtending leaves have fallen. Prescribed size of the patch of bark, taken along with the bud is 5 cm length and 1.5 cm width.

In both types of buds, only those having the core of bud attached to the bud patch after stripping from the budwood, as well as the cambium in good conditions are used for budding.

5. Seedling stumps

Seedlings aged about one year, having a girth of 7.5 cm above the collar region and brown coloured bark upto a minimum height of 45 cm are used for preparing seedling stumps. Specifications for pruning are 45 to 60 cm for tap root, 10 to 15 cm for lateral roots and between 45 and 60 cm (where brown coloured portion ends) for the stem. Pruning is done with a slanting cut. Cut end of stem is sealed by dipping in molten wax up to 2.5 cm from the end.

6. Budded stumps

Budded plants with viable buds, budded at least 30 days earlier are made into budded stumps by pruning the stem and roots. Specifications regarding pruning of stem is 7.5 cm above the upper edge of the bud patch. Pruning is done by a cut of about 45° downward slant from the side of the bud. Tap root is pruned between 45-60 cm and lateral roots are pruned between 10-15 cm. For planting in polybags length of tap root specified is 10-15 cm less than the soil core of the bag. Cut end of stem is sealed with molten wax upto 2.5 cm from the end. The bud patch is then covered with a piece of banana sheath a little bigger than this and secured firmly to the budded stump.

7. Small polybag plants

To raise polybag plants black polythene bags are generally used. For small bag plants bags of lay flat size 55 cm length and 25 cm width are required. Thickness is 400 guage for low density polythene and 300 guage for high density polythene. Plants should have two or three whorls of mature leaves.

8. Large polybag plants

For large plants bag size is 65 cm x 35 cm. Thickness required is 500 guage and 400 guage for low density and high density polythene respectively. Plants should have six or seven whorls of mature leaves.

9. Mini stumps (Mini stumped buddings)

The materials should have brown coloured scion stem upto a length of 60 cm from the bud union, tap root to a length of 45-60 cm and lateral roots to a length of 10-15 cm. Stem should be pollarded by a slanting cut preferably below a whorl of buds and the cut surface treated by a wound dressing compound. Stem has to be white washed with hydrated lime.

10. Maxi stumps (Maxi stumped buddings)

Maxi stumps should have brown coloured scion stem upto a length of 240 cm. Length of tap root and lateral roots, method of pollarding and white washing of the stem and treating the cut end of the stem are similar to mini stumps.

Plants affected by root or stem diseases and nematodes should not be used for planting. If the planting materials are stored, special precautionary methods have to be taken to prevent loss of moisture. If transporting is involved care should be taken to avoid mechanical damages like bruising, bending, breaking and crushing by adopting appropriate packing methods.

Production of planting materials strictly as per the above standards will ensure their quality. In the case of rubber, due to its perennial nature it is all the more important to ensure the quality and correct identity of the planting materials supplied to growers from nurseries.

References:

1. B.B. Desai, P.M. Kotecha and D.K. Solunkha (1997) Seed Certification and legislation. In : Seeds Handbook : Biology, production, processing and storage. Marcel Dekker, Inc. New York, pp. 577-599.

2. Joseph, G. Marattukalam, C.K. Saraswathy Amma and D. Premakumari (1980) Methods of propagation and Materials for planting. In : Radhakrishna Pillai, P.N. (Ed.) Handbook of Natural Rubber Prodduction in India. Rubber Research Institute of India, Kottayam, pp 63-83.

3. Joseph, G. Marattukalam and C.K. Sarawathyamma (1992) Propagation and planting. In : M.R. Sethuraj and N.M. Mathew (Ed.) Natural Rubber : Biology Cultivation and Technology. Elsevier, Amsterdam, pp. 164 - 199.